AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Original) An engine control system for controlling transitions between activated and deactivated modes in a displacement on demand engine, comprising:

an engine speed sensor that generates an engine speed signal; and

a controller that calculates a torque reserve of said engine based on said engine speed signal, that transitions said engine from said activated mode to said deactivated mode when said torque reserve is greater than a threshold torque, and that transitions said engine from said deactivated mode to said activated mode when said torque reserve is lower than said threshold torque.

2. (Original) The engine control system of claim 1 wherein said controller determines available and desired brake torques.

3. (Original) The engine control system of claim 2 wherein said torque reserve is based on a difference between said available brake torque in deactivated mode and said desired brake torque.

4. (Original) The engine control system of claim 2 wherein said available brake torque in deactivated mode is based on atmospheric conditions, engine speed, estimated pumping losses of said engine, estimated friction losses, and inlet charge dilution of said engine.

5. (Original) The engine control system of claim 2 wherein said desired brake torque is based on accelerator pedal position, engine speed, estimated pumping losses of said engine, estimated friction losses, and accessory loads of said engine.

6. (Original) The engine control system of claim 1 wherein said controller generates a torque error signal and adjusts said torque reserve based on said torque error signal.

7. (Original) The engine control system of claim 6 wherein said torque error signal is based on a difference between a vacuum signal received by said controller and a model vacuum signal determined by said controller.

8. (Original) The engine control system of claim 1 wherein said controller transitions from said deactivated mode to said activated mode when said torque reserve is lower than said threshold torque.

9. (Currently Amended) A method for controlling transitions between activated and deactivated modes in a displacement on demand engine, comprising:
determining a torque reserve of said engine based on an engine speed signal;
comparing said torque reserve to a threshold torque; and
transitioning from said activated mode to said deactivated mode when said torque reserve is greater than said threshold torque.

10. (Original) The method of claim 9 further comprising transitioning from said deactivated mode to said activated mode when said torque reserve is lower than said threshold torque.

11. (Original) The method of claim 9 further comprising:
determining a desired brake torque;
determining an available brake torque in deactivated mode; and
determining said torque reserve based on said desired brake torque and said available brake torque.

12. (Original) The method of claim 11 wherein said available brake torque in deactivated mode is based on atmospheric conditions, engine speed, estimated

pumping losses of said engine, estimated friction losses, inlet charge dilution and one of tables and equations of engine efficiency of said engine.

13. (Original) The method of claim 11 wherein said desired brake torque is based on accelerator pedal position, engine speed, estimated pumping losses of said engine, estimated friction losses and accessory loads of said engine.

14. (Original) The method of claim 9 further comprising:

determining a torque error signal; and

adjusting said torque reserve based on said torque error signal.

15. (Original) The method of claim 14 wherein said torque error signal is based on a vacuum signal and a model vacuum signal.

16. (Original) The method of claim 10 further comprising:

generating a vacuum signal of said engine; and

transitioning from said deactivated mode to said activated mode when said torque reserve is one of lower than said threshold torque and said vacuum signal is less than a threshold vacuum signal.

17. (Original) A method for controlling transitions between activated and deactivated modes in a displacement on demand engine, comprising:

determining a torque reserve of said engine;

comparing said torque reserve to a threshold torque;

determining a torque error signal;

adjusting said torque reserve based on said torque error signal;

transitioning from said activated mode to said deactivated mode when said torque reserve is greater than said threshold torque; and

transitioning from said deactivated mode to said activated mode when said torque reserve is lower than said threshold torque.

18. (Original) The method of claim 17 further comprising:

determining a desired brake torque;

determining an available brake torque in deactivated mode; and

determining said torque reserve based on said desired brake torque and said available brake torque.

19. (Original) The method of claim 18 wherein said available brake torque is based on atmospheric conditions, engine speed, estimated pumping losses of said engine, estimated friction losses of said engine and accessory loads of said engine.

20. (Original) The method of claim 18 wherein said desired brake torque is based on accelerator pedal position, engine speed, estimated pumping losses of said engine, estimated friction losses and inlet charge dilution of said engine.

21. (Original) The method of claim 17 wherein said torque error signal is based on a vacuum signal and a model vacuum signal.

22. (Original) The method of claim 17 further comprising:

generating a vacuum signal;

transitioning from said deactivated mode to said activated mode when said torque reserve is one of lower than said threshold torque and said vacuum signal is less than a threshold vacuum signal.